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ABSTRACT

A study investigated the effects of induced mental imagery upon the comprehension of oral versus written discourse for above and below average readers. A secondary purpose of the study was to determine, through a follow-up interview, the students' ability to induce mental imagery. Sixty-three sixth grade students with above or below average reading ability were randomly assigned to one of two conditions--listen/read or read/listen. The students were met individually for approximately 25 minutes and each was instructed to "make pictures in your head to help you remember" under both listening and reading conditions. Immediately after listening to or reading one of two passages, the subjects responded to questions about their use of mental imagery. Following the interview, the subjects were asked to retell the passage information and respond to a cued recall test for the passage they had read. Results showed no statistically significant differences between the effects of induced mental imagery for listening and reading for either free or cued recall. The findings did support previous research conclusions suggesting that poor readers suffer from specific comprehension difficulties that do not appear to involve decoding skills. The findings were also consistent with the assumption that listening and reading comprehension depend upon the same basic process. (FL)

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THE EFFECTS OF INDUCED MENTAL IMAGERY UPON COMPREHENSION: A COMPARISON OF WRITTEN VERSUS ORAL PRESENTATION

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Induced mental imagery has been identified in recent research as a promising strategy for increasing comprehension of discourse (Kulhauy & Swenson, 1975; Lesgold, McCormick & Golinkoff, 1975; Levin, 1973; Steingart & Glock, 1979). Since mental imagery appears to be associated with efficient learning and remembering, it may provide a

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critical link in explaining the transition from a novice to sophisticated comprehender (Pressley, 1976, 1977). One cause for caution, however, with respect to interpreting the results of the research on mental imagery is that increases in learning from written text are slight while the results of learning from orally presented text have been more substantial. It appears that mental imagery has merit as a strategy for increasing listening comprehension but the value of induced mental imagery as a strategy for increasing reading comprehension needs further investigation (Tierney & Cunningham, 1980). The research to date on induced mental imagery does not provide a direct comparison of the effects of induced mental imagery upon listening and reading comprehension.

The main purpose of this study was to investigate the effects of induced mental imagery upon the comprehension of oral versus written discourse for above and below average readers. A secondary purpose was to determine, through a follow-up interview, the students' ability to induce mental imagery.

Method

Subjects

Sixty-three sixth grade above and below average readers enrolled in six suburban Maryland public schools served as subjects in the study. Criteria for

classification as above and below average readers were: (1) Iowa Test of Basic Skills comprehension scores (below average reading scores between 3.5 and 5.5 grade level and above average reading scores of 6.5+), (2) Cognitive Abilities Test scores within 1 standard deviation above or below the mean, and (3) teacher verification of subject identification as an above or below average reader.

Materials

The stimulus materials used in this study consisted of two short (approximately 300 words each) expository type passages written at the 3.0 grade level. A matrix design was used to develop parallel fictional passages about two groups of people. One passage was about the Blue Swamp Clan and a second passage was about the Pine Folks. The passages were developed to reflect the structure of materials which students encounter in the classroom; yet they contained novel information, thereby reducing the possible effects of prior knowledge.

For each passage a set of 10 short answer cued recall questions was constructed. Literal and paraphrase questions were asked for each passage.

A brief interview was developed for use following the listening and reading tasks. The purpose of the interview was to validate if students were able to induce mental imagery when given instructions to do so.

Procedure

Subjects were randomly assigned by ability to one of two condions, listen-read or read-listen, depending upon whether they read or listened to a passage first. Half the students under each condition read the Blue Swamp passage and listened to the Pine Folks, while the reverse was true for the remaining subjects. These procedures were used to control for the effects of condition order and passage order.

The students were met individually for approximately 25 minutes. All subjects were instructed to "make pictures in your head to help you remember" under both listening and reading conditions. Immediately after listening to or reading a passage, the subjects responded to the interview about use of mental imagery. The interview did not tap specific passage information and therefore also served as an intervening activity to eliminate the effects of short term memory upon the comprehension assessments which followed. Upon completion of the interview, students were asked to

retell the passage information. Subjects were told to pretend that they were trying to tell a friend everything they could remember about the Blue Swamp Clan (or Pine Folks). Subjects also responded to a 10-item cued recall test for each passage.

Results

Two independent raters divided the two stimulus passages into propositions of three levels of importance using an adaptation of Meyer's (1975) procedure (interrater reliability for the Blue Swamp passage = .97, Pine Folks = .98). The subjects' free recall protocols for the listening and reading tasks were then scored by two independent raters (interrater reliability = .97).

Preliminary inspection of the data on free and cued recall revealed no differences attributable to story or order of presentation, so these variables were not considered further. Data on free and cued recall were analyzed using analysis of variance with repeated measures.

Significant ability differences were found, as expected, for both listening and reading tasks in favor of the above average readers on both free and cued recall. No statistically significant differences were found between the effects of induced mental imagery for listening and reading for either free (Table 1) or cued (Table 2) recall. On free recall of higher level propositions, however, sex and ability

interaction effects were found for listening and reading. This sex and ability interaction effect was also found on the reading task for recall of lower level propositions (see Table 1).

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Insert Table 1 about here
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Insert Table 2 about here
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Discussion

The results of the comparison of the effects of induced mental imagery under listening and reading conditions are not consistent with the research which suggests that induced mental imagery is more potent for listening than for reading comprehension (Pressley, 1977). The results of the present study suggest that instructions to induce mental imagery may be equally effective under listening and reading conditions. It should be noted that this study attempted to eliminate and reduce major methodological problems inherent in the existing research which has prohibited direct comparisons of the effects of induced mental imagery for listening and reading comprehension of discourse.

Above average males recalled more higher level propositions than above average females, however, below average females recalled more than below average males under both

listening and reading conditions. The same effect was found with respect to lower level propositions under the reading condition. The statistically significant sex and ability interactions found in this study suggest that sex differences may be a promising area for future research.

The results of the interview on use of mental imagery revealed that under the listening condition 17% of the below average subjects reported that they were not able to induce mental imagery while only 3% of the above average readers reported they were unable to do so. Under the reading condition 21% of the below average readers and 6% of the above average readers reported they were unable to induce mental imagery. More below average readers than above average readers report an inability to induce mental imagery. As Tierney and Cunningham (1980) have suggested further research is needed to determine how imagery may be effectively induced since a rather large percentage of below average readers in this study apparently had difficulty imaging.

Finally, the results of this investigation lead to two additional conclusions. First, the results support the findings of Smiley et al. (1977) and Guthrie (1973) which suggest that poor readers suffer from specific comprehension difficulties which do not appear to involve decoding skills. There were large differences between above and below average readers comprehension performance under <u>both</u>

listening and reading conditions. Second, the data are also consistent with the assumption that listening and reading comprehension depend upon the same basic process.

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Table 1

Means and Standard Deviations of Free Recall
Scores for Propositions - Level 1 (highest), Level 2, and Level 3 (lowest)

		Males		Females	
		N=19 Above Average	N=15 Below Average	N=15 Above Average	N=14 Below Average
Level 1 Propositions*					
Listening	M	10.32	6.73	9.67	9.79
	SD	3.63	2.91	3.41	4.22
Reading	M	10.00	7.07	8.47	7.71
	SD	3.48	4.68	2.99	2.86
Level 2 Propositions**					
Listening	M	7.16	5.00	6.87	5.86
	SD	3.33	2.64	3.72	3.65
Reading	M	7.95	6.00	6.53	5.29
	SD	4.07	4.15	3.13	2.75
Level 3 Propositions***					
Listening	M	1.47	1.00	.73	.50
	SD	1.12	.75	.70	.75
Reading	M	1.53	.53	.93	.79
	SD	1.30	.74	.96	.89

*significant ability differences at the .01 level.
**significant sex and ability interaction at the .05 level.
***significant ability differences at the .05 level.

Table 2

Means and Standard Deviations of Number of Correct Answers to Cued Recall Questions

	Males		Females	
	N=19 Above Average	N=15 Below Average	N=13 Above Average	N=14 Below Average
Listening*				
M	9.05	6.66	8.00	7.85
SD	2.39	2.41	2.17	2.14
Reading*				
M	8.94	6.53	7.26	6.21
SD	2.48	2.29	2.73	2.86

*significant ability differences at the .01 level.